APPENDIX A

Discussion of Initial NESHAPs Modeling

INEEL
Idaho National Engineering & Environmental Laboratory

INTEROFFICE MEMORANDUM

Date: October 25, 2000

To: P. S. French MS–3953 6- 9473

From: S. K. Zohner MS 3428 6-3669

Subject: NESHAP PTC DETERMINATION FOR RADIONUCLIDE EMISSIONS FROM ICDF AT 30% DESIGN - SKZ-06-00

Summary

The following summarizes the NESHAP PTC determination for ICDF Operations for radioactivity using 40 CFR 61 Appendix D.

- The SSSTF determination concluded that this facility by itself does not meet the requirements for a PTC.
- The Landfill determination concluded that it does meet the requirements for a PTC for this operation.
- The Evaporation Pond determination concluded that it does meet the requirements for a PTC.

Since these three facilities, (SSSTF, Landfill and Evaporation Pond) will operate as a unit, it is concluded that a PTC covering all three operating units meet the requirements for a PTC under 40 CFR 61 Appendix D.

Discussion

The following pages describe the assumptions and calculations for the PTC determination. The SSSTF NESHAP determination was done by Chris. S. Staley. I did the Landfill and Evaporation Pond determination.

1. SSSTF Airborne Radionuclide Source Term and Doses

The following assumptions were made in developing the airborne radionuclide releases from the SSSTF:

- Only wastes undergoing stabilization in SSSTF have potential for radiological emissions; soils going to ICDF without treatment are not considered in SSSTF source term
- Handling/stabilizing soil represents worst case from emissions standpoint; bounds other SSSTF releases
- For each release site, maximum radionuclide concentrations measured in soil are assumed for all soil from that release site (maximums are from EDF-1540, *Waste Inventory Design Basis*)
- All waste being stabilized is treated as soil, i.e., total waste volume is assumed to be soil at maximum radionuclide concentrations
- Release fraction of 1E-03 for particulate radionuclides assumed per 40 CFR 61, Appendix D (NESHAP Guidance)
- No cleanup of airborne releases from SSSTF is credited
- Spreadsheet "Waste Schedule 9-27-00" used to allocate source terms by year (Table 1)
- Source term calculation:
  - Total Ci radionuclide i in waste = Vol waste (yd^3) x 0.765 m^3/yd^3 x 1E06 cc/m^3 x 1.5 g/cc (soil density) x measured level of radionuclide i (pCi/g) x 1Ci/1E12 pCi
- Release of radionuclide i (Ci) = Total Ci radionuclide i in waste x 1E-03 (where i represents any one of the many radionuclides present in the waste).
- Doses modeled with CAP88 (modeling software as required by 40 CFR Part 61) dispersion/dose code
  - Ground-level release
  - 10-year average meteorology from 10m level of NOAA's Grid 3 tower

- Dose to Maximally Exposed Individual at INEEL boundary, 13900 m SSW

Table 1. SSSTF waste stabilization: waste volumes and resultant worst case doses to MEI

Year	Release Site	Volume (yd3)	Dose (mrem/yr)
2001	CFA-04	800	1.1E-04
2003	Borax-01	11110	5.2-03
2004	ARA-12	1000	6.0E-03
	ARA-25	36	
	WRRTF-1	20070	
	CPP-92	1370	
	CPP-98	250	
	CPP-99	126	
2005	ARA-12	1000	7.1E-05
	ARA-25	36	

2. ICDF Landfill (INEEL CERCLA Disposal Facility)

The following assumptions were made in developing the airborne radionuclide releases from the Landfill.

- All of the radioactive materials going to the landfill were assumed not to have been grouted.
- The total activity in all the soil was assumed to be distributed evenly per cubic yards.
- The maximum yearly soil volume to the landfill was 37% based on information from EDF-1547, Staging, Storage, Sizing, and Treatment Facility (SSSTF) Draft dated 10/2/00 provided by Stephanie Walsh.
- Landfill emissions were based on the maximum yearly volume of 37%.
- The soil radioactivity used was from Clem Potelunas database (CWID Database of Detectable Hits Chronologically by Site) dated 9/27/2000.
- 40 CFR 61, Appendix D resuspension factor of 1/1,000 was used for soil to air.

- Doses modeled with CAP88 dispersion/dose code
  - Ground-level release
  - 10-year average meteorology from 10m level of NOAA's Grid 3 tower
  - Dose to Maximally Exposed Individual at INEEL boundary, 13900 m SSW

Perchased water and aquifer water will also go to the evaporation pond. It was not included in this analysis because the radioactivity in the water is so low (DOE/ID, 1997, "Comprehensive RI/FS for the Idaho Chemical Processing Plant OU3-13 at the INEEL – Part A, RI/BRA Report (Final), DOE/ID-10534, November provided by Eric Neher). Attachment 1 summarizes the water results.

Attachment 2 CWID Database of Detected Hits Chronologically by Site, provides the radioactive inventory for the soil going to the landfill. (Clem Potelunas provide the spreadsheet dated 9/27/2000). The unit curie dose to the site boundary for a ground level release was calculated by Chris Staley which is in Attachment 3. The schedule for Landfill operations came from the draft EDF-1547 and is provided below.

Landfill Soil Schedule

year	Cubic yards	Percent of Total Volume
2001	5,800	1 %
2003	25,792	6 %
2004	134,283	33 %
2005	147,228	37 %
2006	60,970	15 %
2007	11,160	3 %
2008	17,507	4 %
Total	402,740 yd^3	

The calculated dose to the MEI assumed to be on the Site boundary was 11 mrem/yr using the maximum or most conservative numbers. For the best estimate (averaged numbers) the dose was calculated to be 3 mrem/yr. Since these doses are greater than 0.1 mrem/yr, a PTC would normally be required for the Landfill operation.

3. ICDF Evaporation Pond

The following assumptions were made in developing the airborne radionuclide releases from the Evaporation Pond.

- 40 CFR 61, Appendix D partition factor of 1/1,000 was used to estimate the radioactivity leaching from the soil into the leachate.
- The worst case year was assumed to be 37% of the total activity going into the Landfill.
- Appendix D partition factor of 1/1,000 was used to estimate the radioactivity from the liquid in the Evaporation Pond going to air.
- Doses modeled with CAP88 dispersion/dose code.
  - Ground-level release
  - 10-year average meteorology from 10m level of NOAA's Grid 3 tower
  - Dose to Maximally Exposed Individual at INEEL boundary, 13900 m SSW
- Assumed that all the radioactivity going to the Evaporation Pond is released into the air because this "is intentionally dispersed into the environment, it must be considered to be a gas" which has a release fraction of 1 (40 CFR 61 Appendix D).
- D&D waste water was not included in the analysis.

The calculated dose to the Site boundary was 11 mrem/yr using the most conservative and 3 mrem/yr using the average. Since these doses are greater than 0.1 mrem/yr, a PTC would normally be required for the Evaporation Pond operation.

Table 2 summarizes the dose to the MEI for both the landfill and evaporation pond.

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Table 2. ICDF Landfill and Evaporation Pond dose results to the MEI.

maximum yearly Ci to landfill %	landfill to air	landfill to leachate	pond to air	maximum mrem	average mrem
37%	1/1,000			11	3.0
37%	----	1/1,000	1	11	3.0

The doses are above the 0.10 mrem/yr limit so it is concluded that these operations would normally require a PTC.

Conclusion

The NESHAP evaluation to determine if a permit to construct is found in 40 CFR 61 Appendix D. Each of the three facilities were evaluated using Appendix D. The dose to the MEI for the Landfill and the Evaporation Pond exceeded 0.10 mrem/yr. This means that they meet the requirements for a PTC. The SSSTF dose was less than 0.10 mrem/yr so it didn't meet the requirements for a PTC.

Since the SSSTF, Landfill and Evaporation Pond will operate as a unit, it is concluded that this unit would require a PTC under 40 CFR 61 Appendix D.

Please contact me if you have questions or need clarification on the NESHAP process.

SKZ

Attachments

1) Well water radioactivity (disk)
2) Landfill radioactivity (disk)
3) Unit Curie dose for ground level model (disk)
4) EDF #8 Draft

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cc: With Out Attachments
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C. S. Staley, MS-2107
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L. C. Tuott, MS-3953

With Attachment
UFC 6103/CFL-2, MS-4110

Attachment 1

Purge and Aquifer Water Going to the Evaporation Pond

	Purge 50 gal/ea/yr	Aquifer 1000 gal/ea/yr		Spec	Nuclide
	Ci/yr	Ci/yr	total Ci/yr wells	activity mrem/Ci	total mrem/yr
Gross alph	3.21E-07	4.9E-07	8.1E-07		
Gross beta	0.000199	1.3E-05	2.1E-04		
H-3	1.78E-05	2.5E-03	2.5E-03	8.30E-06	2.1E-08
Sr-90	0.000103	2.7E-06	1.1E-04	4.70E-02	4.9E-06
Pu-238	3.22E-11	0.0E+00	3.2E-11	3.5	1.1E-10
Pu-239	0	0.0E+00	0.0E+00	3.8	0.0E+00
Am-241	3.03E-11	2.0E-09	2.1E-09	5.80E+00	1.2E-08
Np-237	0	0.0E+00	0.0E+00	5.30E+00	0.0E+00
I-129	0	1.6E-08	1.6E-08	4.30E-02	6.7E-10
Tc-99	8.05E-08	5.9E-06	5.9E-06		0.0E+00
U-234	5.45E-09	4.4E-08	4.9E-08	1.4	6.9E-08
U-235	0	0.0E+00	0.0E+00	1.3	0.0E+00
U-238	2.06E-09	1.4E-08	1.6E-08	1.3	2.1E-08
Total Ci/yr	3.2E-04	2.5E-03	2.8E-03		5.1E-06

Combined well waters

	Spec activity mrem/Ci	48,000 gal total Ci/yr wells	48,000 gal/yr mrem/yr best est	yrs operation 50 mrem	NESHAP App D 1 yr data 1000 mrem	NESHAP App D 25 yr data 1000 mrem	accumulation reduction
		8.08E-07					
		2.12E-04					
H-3	2.09E-05	2.49E-03	5.2E-08	2.6E-06	5.21E-11	1.30E-09	
Sr-90	7.06E-23	1.05E-04	7.4E-27	3.7E-25	7.43E-30	1.86E-28	
Pu-238	5.14	3.22E-11	1.7E-10	8.3E-09	1.65E-13	4.13E-12	
Pu-239	5.55	0	0	0	0	0	
Am-241	8.52E+00	2.07E-09	1.8E-08	8.8E-07	1.77E-11	4.42E-10	
Np-237	7.79E+00	0.00E+00	0.0E+00	0.0E+00	0.00E+00	0.00E+00	
I-129	1.47E-01	1.55E-08	2.3E-09	1.1E-07	2.28E-12	5.70E-11	
Tc-99	1.45E-02	5.94E-06	8.6E-08	4.3E-06	8.61E-11	2.15E-09	
U-234	2.09	4.94E-08	1.0E-07	5.2E-06	1.03E-10	2.58E-09	
U-235	1.98	0	0	0	0	0	
U-238	1.87	1.61E-08	3.0E-08	1.5E-06	3.00E-11	7.51E-10	

Attachment 2

CWID Database of Detected Hits Chronologically by Site

Year	Release Site	Number of Samples	Number of Samples Detected	Overall Mean[1] ug/kg or pCi/g	Standard Deviation	Maximum Concentration ug/kg or pCi/kg	Maximum Concentration mg/kg or pCi/g	Compound	Waste Volume M^3	Waste Volume yd^3	Mean Contaminant Mass, mg or Ci	Maximum Contaminant Mass, mg or Ci	Maximum Contaminant Mass, Kg or Ci
2004	ARA-01	2	2	0.865	0.94	1.53	1.53	Cs-137	1820.77	2381.478	0.002362	0.004179	0.004179
2004	ARA-12	31	31	0.96	1.144	4.42	4.42	Cs-137	1503	1965.85	0.002168579	0.0099845	0.0099845
2004	ARA-23	54	53	63.051	291.037	2140	2140	Cs-137	35537	46480.05	3.367579133	114.2982561	114.2982561
2004	ARA-25	6	6	2496.833	4867.24	12400	12400	Cs-137	54	70.62935	0.202243	1.0044	1.0044
2003	BORAX-01	72	57	30.305	212.677	1800	1800	Cs-137	8499	11116.28	0.386343	22.9473	22.9473
2003	BORAX-08	110	110	45.096	218.021	2130	2130	Cs-137	99.96	130.7428	0.006762	0.319372	0.319372
2003	CFA-04	57	39	0.323	0.453	2	2	Cs-137	6338	8289.793	0.003059	0.018944	0.018944
2007	CPP-01/04/05	16	16	4349.873	11645.195	46000	46000	Cs-137	3256.44	4259.264	21.247651	224.69436	224.69436
2006	CPP-03	8	8	24.713	28.043	65.1	65.1	Cs-137	8495.05	11111.11	0.314907	0.829542	0.829542
2007	CPP-04/05	3	3	25500	1732.051	26500	26500	Cs-137	0		0	0	0
	CPP-06	3	3	5.253	7.932	14.4	14.4	Cs-137	0		0	0	0
2007	CPP-08/09	4	4	532.275	582.867	1080	1080	Cs-137	2370.12	3100.001	1.892333	3.839594	3.839594
2007	CPP-10	6	6	490.642	536.212	1190	1190	Cs-137	322.81	422.2197	0.237576	0.576216	0.576216
2007	CPP-11	11	11	24.373	25.402	72.7	72.7	Cs-137	1141.17	1492.594	0.041721	0.124445	0.124445
2008	CPP-13	10	9	1677.682	2211.696	4630	4630	Cs-137	3075	4021.949	7.738308	21.355875	21.355875
2005	CPP-14	16	8	1.488	2.027	6.21	6.21	Cs-137	8445	11045.65	0.018886333	0.07881998	0.07881998
2004	CPP-15	17	17	80238.441	191008.201	586000	586000	Cs-137	308.65	403.6991	37.148392	271.30335	271.30335
	CPP-17	7	7	5.602	6.952	19.4	19.4	Cs-137	0		0	0	0
2005	CPP-19	12	12	34010.448	117776.166	408000	408000	Cs-137	2897	3789.134	147.792402	1772.964	1772.964
	CPP-20/25	11	11	33.983	32.5	114	114	Cs-137	205.3	268.5223	0.010465	0.035106	0.035106
	CPP-22	2	2	9	7.495	14.3	14.3	Cs-137	0		0	0	0
	CPP-26	9	9	2445.778	2847.598	6730	6730	Cs-137	546.52	714.8214	2.005	5.517119	5.517119
	CPP-27/33	73	54	135.189	268.792	1370	1370	Cs-137	1415.84	1851.849	0.287109	2.909551	2.909551
	CPP-28	1	1	77400000	0	77400000	77400000	Cs-137	64.28	84.07509	7462.908	7462.908	7462.908
	CPP-31	1	1	1650000	0	1650000	1650000	Cs-137	4474.06	5851.851	11073.2985	11073.2985	11073.2985
	CPP-32	3	3	187	78.46	277	277	Cs-137	0.34	0.444703	0.000095	0.000141	0.000141
2004	CPP-34	20	20	317.24	568.081	2000	2000	Cs-137	20912	27351.87	9.951184	62.736	62.736
2008	CPP-35	16	16	663.301	2141.324	8640	8640	Cs-137	238	311.2923	0.236798	3.08448	3.08448
2008	CPP-36/91	34	32	186135.062	916409.48	5174400	5174400	Cs-137	9571	12518.4	2672.248018	74286.2736	74286.2736
2004	CPP-37A	14	9	0.748	1.098	3.82	3.82	Cs-137	8325.15	10888.89	0.009341	0.047703	0.047703
2004	CPP-37B	28	19	1.263	1.622	6.31	6.31	Cs-137	78324	102444	0.148385	0.741337	0.741337
	CPP-40	2	2	0.785	0.785	1.34	1.34	Cs-137	0		0	0	0
	CPP-46	2	2	1.2	0.792	1.76	1.76	Cs-137	0		0	0	0
2005	CPP-48	4	4	50.75	13.276	65	65	Cs-137	226.25	295.9239	0.017223	0.022059	0.022059
	CPP-58	13	13	18.336	21.433	63.6	63.6	Cs-137	7702.18	10074.07	0.211841	0.734788	0.734788
	CPP-603	4	4	8.188	10.931	23.9	23.9	Cs-137	0		0	0	0
	CPP-61	7	7	1.403	0.88	2.51	2.51	Cs-137	0		0	0	
2004	CPP-67	21	21	23.225	29.736	93.6	93.6	Cs-137	75889	99259.09	2.643783	10.654816	10.654816
	CPP-78	4	4	0.233	0.111	0.38	0.38	Cs-137	0		0	0	0
	CPP-79	7	7	8471432.537	14655453	33700000	33700000	Cs-137	2944.95	3851.85	37421.91788	148867.2225	148867.2225
	CPP-80	1	1	110000000	0	110000000	110000000	Cs-137	0		0	0	
	CPP-88	33	32	6.372	10.47	36.6	36.6	Cs-137	0		0	0	0
	CPP-90	9	9	2.059	2.288	7.5	7.5	Cs-137	0		0	0	0
2004	CPP-92	17	17	1032.748	2484.48	7730	7730	Cs-137	1047	1369.425	1.621931	12.139965	0.038791
2004	CPP-97	11	11	33.983	32.5	114	114	Cs-137	1147	1500.22	0.058468	0.196137	0.196137
	PM-2A TK SLUDGE	7	7	453871.429	486007.65	1170000	1170000	Cs-137	9.18	12.00699	6.24981	16.1109	16.1109
2003	TSF-09/18	4	4	31.588	48.675	103	103	Cs-137	3337	4364.632	0.158424886	0.516581085	0.516581085
2003	TSF-26	3	3	3.298	4.444	8.43	8.43	Cs-137	7811	10216.41	0.038641	0.09877	0.09877
2004	WRRTF-01	7	7	0.52	0.398	1.13	1.13	Cs-137	15347	20073.12	0.011971	0.026013	0.026013

Attachment 3

Unit Ci for a ground level release from INTEC to the INEEL boundry.

9/25/00	
mrem/Ci	
2.09E-05	H-3
8.08E-02	K-40
6.52E-03	Mn-54
1.36E-03	Co-57
2.49E-03	Co-58
1.02E-01	Co-60
2.08E-04	Ni-63
7.06E-02	Sr-90
2.35E-03	Nb-95
1.78E-03	Zr-95
2.00E-02	Zn-65
1.45E-02	Tc-99
8.54E-04	Ru-103
1.26E-02	Ru-106
1.05E-02	Sb-125
1.47E-01	I-129
5.61E-02	Cs-134
1.04E-01	Cs-137
8.27E-03	Ce-144
9.82E-02	Eu-152
7.91E-02	Eu-154
3.48E-03	Eu-155
1.16E-03	Hf-181
2.18E-03	Hg-203
3.14E-01	Ra-226
3.76	Th-228
3.76	Th-230
9.08	Th-232
4.77E-03	Th-234
2.13	U-233
2.09	U-234
2.13	U-233/234
1.98	U-235
1.98	U-235/236
1.98	U-236
1.87	U-238
7.79E+00	Np-237
5.14	Pu-238
5.55	Pu-239
5.55	Pu239/240
5.54	Pu-240
8.72E-02	Pu-241
5.28	Pu-242

APPENDIX B

Waste Profile Sheet

WASTE CERTIFICATION FORM

Package identification number(s): _____

The undersigned certifies that, to the best of his/her knowledge, the waste identified above meets the waste acceptance criteria for the SSSTF. A complete and comprehensive copy of the laboratory analytical data is attached to the Waste Profile Sheet.

_____

Certification:

Name (print) _____ Signature _____ Date _____

Title _____ Phone: _____

Email: _____

WASTE PROFILE SHEET

WASTE PROFILE SHEET

PART I

A. GENERAL INFORMATION WASTE PROFILE NO. _____

1. GENERATOR NAME

2. FACILITY ADDRESS/LOCATION

3. 20 X LDR TCLP
Process Knowledge

4. WAG ID & Uniform Waste Stream

5. TECHNICAL CONTACT

6. TITLE

7. PHONE ( )

8. e-mail:

B. 1. NAME OF WASTE
2. USEPA/or/STATE WASTE CODE(S) _____
3. PROCESS GENERATING WASTE _____
4. PROJECTED ANNUAL VOLUME/UNITS _____ / _____ 5. MODE OF COLLECTION _____
6. IS THIS WASTE A DIOXIN LISTED WASTE AS DEFINED IN 40 CFR 261.31 ? _____
__ YES __ NO
7. IS THIS WASTE RESTRICTED FROM LAND DISPOSAL (40 CFR 268)? __ YES __ NO
HAS AN EXEMPTION BEEN GRANTED? __ YES __ NO
DOES THE WASTE MEET APPLICABLE TREATMENT STANDARDS? __ YES __ NO

PART II

1. MATERIAL CHARACTERIZATION

COLOR(required)
DENSITY _____ BTU/LB _____
TOTAL SOLIDS _____ ASH CONTENT _____
LAYERING: (required) __ MULTILAYERED __
BILAYERED __ SINGLE PHASE

2. RCRA CHARACTERISTICS

PHYSICAL STATE: __ SOLID __ LIQUID __ SEMI-SOLID
__ GAS __ OTHER

TREATMENT GROUP: __ WASTEWATER __ NON-WASTEWATER
__ IGNITABLE (D001) __ REACTIVE (D003)
FLASH POINT (F) _____ __ WATER REACTIVE
__ HIGH TOC (> 10%) __ CYANIDE REACTIVE
__ LOW TOC (< 10%) __ SULFIDE REACTIVE
__ CORROSIVE (D002) __ TOXICITY CHARACTERISTIC
pH _____ *(SEE PART III)*
__ CORRODES STEEL

3. CHEMICAL COMPOSITION (ppm or mg/L)

COPPER _____ PHENOLICS _____
NICKEL _____ TOTAL HALOGENS _____
ZINC _____ VOLATILE ORGANICS _____
CHROMIUM-HEX _____ PCBs _____
(OTHER) _____

NOTE: EXPLOSIVES, SHOCK-SENSITIVE, PYROPHORIC,, AND ETIOLOGICAL WASTE NORMALLY MAY NOT BE ACCEPTED BY THE SSA DESIGNEE WITHOUT SPECIFIC APPROVAL.

4. MATERIAL COMPOSITION

COMPONENT	CONCENTRATION	RANGE

TOTAL _____ 100%

5. SHIPPING INFORMATION

DOT HAZARDOUS MATERIAL? __ YES __ NO
PROPER SHIPPING NAME _____

U.N. OR
HAZARD CLASS _____ N.A. NO. _____
ADDITIONAL DESCRIPTION _____
METHOD OF SHIPMENT __ BULK __ DRUM __
OTHER:
CERCLA REPORTABLE QUANTITY (RQ) _____
EMERGENCY RESPONSE GUIDE PAGE
DOT PUBLICATION 5800.4 PAGE NO. _____
EDITION (YR)
SPECIAL HANDLING INFORMATION _____

GENERATOR INFORMATION

BASIS FOR INFORMATION

__ CHEMICAL ANALYSIS *(ATTACH RESULTS)*

__ USER *KNOWLEDGE (ATTACH SUPPORTING DOCUMENTS - Explain how and why these documents comply with RCRA requirements.*

I, _____, HEREBY CERTIFY THAT ALL INFORMATION SUBMITTED IN AND ALL ATTACHED
(Print or Type Name)
DOCUMENTS IS TO THE BEST OF MY KNOWLEDGE AN ACCURATE REPRESENTATION OF THE WASTE TURNED IN TO THE SSA.

ALL KNOWN OR SUSPECTED HAZARDS HAVE BEEN DISCLOSED.

SIGNATURE OF GENERATOR'S REPRESENTATIVE	**DATE**

7. WASTE ACCEPTANCE INTO ICDF Landfill SSTF Evaporation Pond

SIGNATURE OF ICDF Comlex DESIGNEE **Preliminary Acceptance**	**DATE**
SIGNATURE OF ICDF Complex DESIGNEE **Final Acceptance**	**DATE**

PART III

HAZARDOUS CHARACTERISTIC LIST

Total Metals TCLP* Process Knowledge

CONTAMINANT	EPA HW No.	(mg/L)	CONTAMINANT	EPA HW No.	(mg/L)
__ ARSENIC	D004		__ HEXACHLORO-1,3,-BUTADIENE	D033	
__ BARIUM	D005		__ HEXACHLOROETHANE	D034	
__ BENZENE	D018		__ LEAD	D008	
__ CADMIUM	D006		__ LINDANE	D013	
__ CARBON TETRACHLORIDE	D019		__ MERCURY	D009	
__ CHLORDANE	D020		__ METHOXYCHLOR	D014	
__ CHLOROBENZENE	D021		__ METHYL ETHYL KETONE	D035	
__ CHLOROFORM	D022		__ NITROBENZENE	D036	
__ CHROMIUM	D007		__ PENTACHLOROPHENOL	D037	
__ O-CRESOL	D023		__ PYRIDINE	D038	
__ M-CRESOL	D024		__ SELENIUM	D010	
__ P-CRESOL	D025		__ SILVER	D011	
__ CRESOL	D026		__ TETRACHLOROETHYLENE	D039	
__ 2,4-D	D016		__ TOXOPHENE	D015	
__ 1,4-DICHLOROBENZENE	D027		__ TRICHLOROETHYLENE	D040	
__ 1,2-DICHLOROETHANE	D028		__ 2,4,5-TRICHLOROPHENOL	D041	
__ 1,1-DICHLOROETHYLENE	D029		__ 2,4,6-TRICHLOROPHENOL	D042	
__ 2,4-DINITROTOLUENE	D030		__ 2,45-TP (SILVEX)	D017	
__ ENDRIN	D012		__ VINYL CHLORIDE	D043	
__ HEPTACHLOR (AND ITS HYDROXIDE)	D031				
__ HEXACHLOROBENZENE	D032				

***TCLP data are required for waste streams where total metals exceed 20X the TCLP LDRs.**

All required analysis for this sheet must be attached prior to submittal.

PART IV
RADIOLOGICAL LIST

ISOTOPE	%	(pCi/g)	ISOTOPE	%	(pCi/g)
___ ^{3}H			___ ^{60}Co		
___ ^{7}Be			___ ^{60}Co act. metal[C]		
___ ^{10}Be			___ ^{63}Ni		
___ ^{14}C			___ ^{63}Ni act. metal[C]		
___ ^{14}C act. Metal[C]			___ ^{65}Zn		
___ ^{22}Na			___ ^{68}Ge		
___ ^{32}P			___ ^{75}Se		
___ ^{35}S			___ ^{79}Se		
___ ^{36}Cl			___ ^{82}Sr		
___ ^{40}K			___ ^{85}Kr		
___ ^{45}Ca			___ ^{85}Sr		
___ ^{46}Sc			___ ^{88}Rb		
___ ^{49}V			___ ^{88}Y		
___ ^{51}Cr			___ ^{89}Sr		
___ ^{54}Mn			___ ^{90}Sr–^{90}Y		
___ ^{55}Fe			___ ^{93}Mo		
___ ^{56}Co			___ ^{93m}Nb		
___ ^{57}Co			___ ^{93}Zr		
___ ^{58}Co			___ ^{94}Nb		
___ ^{59}Fe			___ ^{94}Nb act.[C]		
___ ^{59}Ni			___ ^{95}Nb		
___ ^{59}Ni act. Metal[C]			___ ^{207}Bi		
___ ^{95}Zr–^{95m}Nb			___ ^{210}Pb		
___ ^{99}Tc			___ ^{210}Po		
___ ^{103}Ru–^{103m}Rh			___ ^{226}Ra		
___ ^{106}Ru–^{106}Rh			___ ^{227}Ac		
___ ^{107}Pd			___ ^{228}Ra		
___ ^{108m}Ag			___ ^{228}Th		
___ ^{109}Cd			___ ^{229}Th		
___ ^{110m}Ag–^{110}Ag			___ ^{230}Th		
___ ^{113m}Cd			___ ^{231}Pa		
___ ^{113}Sn			___ ^{232}Th		
___ ^{119m}Sn			___ Total U		
___ ^{121m}Sn			___ ^{232}U		
___ ^{121}Te			___ ^{233}U		
___ ^{123}Te			___ ^{234}Th		
___ ^{124}Sb			___ ^{234}U		
___ ^{125}I			___ ^{235}U		
___ ^{126}Sn–^{126m}Sb			___ ^{236}Pu		
___ ^{125m}Te			___ ^{236}U		
___ ^{125}Sb			___ ^{237}Np[d]		
___ ^{127m}Te–^{127}Te			___ ^{238}Pu[d]		
___ ^{129}I			___ ^{238}U		
___ ^{129m}Te			___ ^{239}Pu[d]		
___ ^{131m}Xe					

RADIOLOGICAL LIST (continued)

ISOTOPE	%	(pCi/g)	ISOTOPE	%	(pCi/g)
___ ^{133}Ba			___ $^{240}Pu^{d}$		
___ ^{134}Cs			___ $^{241}Am^{d}$		
___ ^{135}Cs			___ ^{241}Pu		
___ ^{137}Cs–^{137m}Ba			___ $^{242m}Am^{d}$		
___ ^{140}Ba			___ ^{242}Cm		
___ ^{141}Ce			___ $^{242}Pu^{d}$		
___ ^{144}Ce–^{144}Pr			___ $^{243}Am^{d}$		
___ ^{147}Nd			___ $^{243}Cm^{d}$		
___ ^{147}Pm			___ ^{244}Cm		
___ ^{147}Sm			___ $^{244}Pu^{d}$		
___ ^{150}Eu			___ $^{245}Cm^{d}$		
___ ^{151}Sm			___ $^{246}Cm^{d}$		
___ ^{152}Eu			___ $^{247}Bk^{d}$		
___ ^{152}Gd			___ $^{247}Cm^{d}$		
___ ^{153}Gd			___ $^{248}Cm^{d}$		
___ ^{154}Eu			___ $^{249}Cf^{d}$		
___ ^{155}Eu			___ ^{250}Cf		
___ ^{170}Tm			___ $^{250}Cm^{d}$		
___ ^{175}Hf			___ $^{251}Cf^{d}$		
___ ^{181}Hf			___ ^{252}Cf		
___ ^{182}Ta			___ ^{254}Es		
___ ^{185}W					
___ ^{187}Re					
___ ^{195}Au					
___ ^{203}Hg					
___ ^{204}Tl					

PART V

LABELING	Yes	No
1. Are containers marked with the waste generation date?		
2. Does container have CERCLA label?		
3. Does container have IWTS label?		
5. PCB Containing Waste (40 CFR 761.45)?		
Large PCB Mark (M_L) [for large containers] / Small PCB Mark (M_S) [used for small containers]		

PART VI

PACKAGING TYPE

Waste Type	55 Gallon Drum[a] Or other sized steel drums	Roll Off Containers[a]	Crosslink Polyethylene Tanks (storage) Or tanker truck (transport)		INEEL Wood Boxes[a] 2 x 4 x 8 ft 4 x 4 x 4 ft 4 x 4 x 8 ft
			VCT[c]	VOT[c]	
Hazardous	XX	XX	—	—	XX
RAD[b]	XX	XX	—	—	XX
RAD & Mixed RAD[b]	XX	XX	—	—	XX
Asbestos-TSCA	XX	XX—	—	—	XX
Asbestos-TSCA/RAD Waste[b]	XX	XX—	—	—	—XX
Purge Water	—	—	XX	XX	—
Case-by-Case[d]	XX—	XX—	XX	XX	—XX

a. Drums, roll-offs, and INEEL wood boxes will be lined with polyethylene liners (or supersacks). Roll-off containers will have containers.

b. Low-level radioactive waste shall be packaged for disposal in accordance with 10 CFR 61.56(a). The container must also be surveyed to ensure occupational exposures to radiation are < 500 mR/h at 1 meter for the exterior of the container. If the containers radiation level is > 500 mR/h then the container must be shielded by other containers within the SSA

.

c. VCT (Vertical Closed Top) and VOT (Vertical Open Top) above ground tanks will meet or exceed ASTM D 1998-91, Type Tanks molded from crosslinkable polyethylene.

d. Wastes accepted on a case-by-case basis could require special container requirements. Therefore, the generator must verify proper containers with 49 CFR 101, Subpart C

e. Drums, roll offs, and INEEL wood boxes will be lined with polyethylene liner.

NOTE: Other types of containers may be used if they have received approval prior to shipment.

CHAIN-OF-CUSTODY FORM

Database Tracking No. _____
Profile No. _____
Waste Description _____
Generator _____
Collector's Name _____ Date/Time Shipped _____
Shipping Volume _____ _____

PRECAUTIONS: _____
_____

Handling Section

Received From _____

Received By _____ Date/Time Received _____

Name of Receiving Organization _____
_____

Comments _____
_____

Received From _____
_____

Received By _____ Date/Time Received _____

Name of Receiving Organization _____
_____

Comments _____
_____

Received From _____
_____

Received By _____ Date/Time Received _____

Name of Receiving Organization _____
_____

Comments _____
_____